

| | | | |
|--|--|-----------------------------------|--------------------------|
| Form PTO-1449 | U.S. Department of Commerce Patent and Trademark Office | Atty. Docket No. 01-661-A | Serial No. 10/034,451 |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | Applicant: Mirkin, et al. | |
| | | Filing Date: December 28, 2001 | Group: 1637 |



U.S. PATENT DOCUMENTS

| Examiner Initial | Document Number | Date | Name | Class | Subclass | Filing Date |
|------------------|-----------------|------|------|-------|----------|-------------|
|------------------|-----------------|------|------|-------|----------|-------------|

FOREIGN PATENT DOCUMENTS

| Document Number | Date | Country | Class | Subclass | Translation Yes No |
|-----------------|------|---------|-------|----------|--------------------------|
|-----------------|------|---------|-------|----------|--------------------------|

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

| | | | |
|----|-----|---|---|
| TS | 1. | ✓ | Carla M. Aguirre, Cristin E. Moran, James F. Young, and Naomi J. Halas, " <u>Laser-Induced Reshaping of Metallodielectric Nanoshells under Femtosecond and Nanosecond Plasmon Resonant Illumination</u> ", <i>J. Phys. Chem. B</i> , Vol. 108, 7040-7045 (2004). |
| | 2. | ✓ | Carla M. Aguirre, Tara R. Kaspar, Corey Radloff, and Naomi J. Halas, " <u>CTAB Mediated Reshaping of Metallodielectric Nanoparticles</u> ", <i>Nano Letters</i> , Vol. 3, No. 12, 1707-1711 (2003). |
| | 3. | ✓ | R. D. Averitt, S. L. Westcott, and N. J. Halas, " <u>The ultrafast optical properties of gold nanoshells</u> ", <i>J. Opt. Soc. Am. B.</i> , Vol. 16, No. 10, 1814-1823 (1999). |
| | 4. | ✓ | R. D. Averitt, S. L. Westcott, and N. J. Halas, " <u>Linear optical properties of gold nanoshells</u> ", <i>J. Opt. Soc. Am. B.</i> , Vol. 16, No. 10, 1824-1832 (1999). |
| | 5. | ✓ | R. D. Averitt, S. L. Westcott and N. J. Halas, " <u>Ultrafast Electron Dynamics in Gold Nanoshells</u> ", <i>Phys. Rev. B</i> , Vol. 58, R10203-R10206 (1998). |
| | 6. | ✓ | C. Charnay, A. Lee, S. Man, C. E. Moran, C. Radloff, R. K. Bradley, and N. J. Halas, " <u>Reduced Symmetry Metallodielectric Nanoparticles: Chemical Synthesis and Plasmonic Properties</u> ", <i>J. Phys. Chem. B</i> , Vol. 107, 7327-7333 (2003). |
| | 7. | ✓ | N.K. Grady, N.J. Halas, and P. Nordlander, " <u>Influence of dielectric function properties on the optical response of plasmon resonant metallic nanoparticles</u> ", <i>Chem. Phys. Lett.</i> , Vol. 399, 167-171 (2004). |
| | 8. | ✓ | Naomi Halas, " <u>The Optical Properties of Nanoshells</u> ", <i>Optics and Photonics News</i> , 26-30 (2002). |
| | 9. | ✓ | N. J. Halas, G. D. Hale, S. J. Oldenburg, " <u>Dynamics of Triplet Excitons in MEH-PPV measured by Two-Photon Photoemission</u> ", <i>SPIE Proceedings</i> , Vol. 3145, pp. 229-239 (1998). |
| | 10. | ✓ | G. D. Hale, J. B. Jackson, O. E. Shmakova, T. R. Lee, and N. J. Halas, " <u>Enhancing the Active Lifetime of Luminescent Semiconducting Polymers Via Doping With Metal Nanoshells</u> ", <i>Appl. Phys. Lett.</i> , Vol. 78, No. 11, 1502-1504 (2001). |
| | 11. | ✓ | L. R. Hirsch, R. J. Stafford, J. A. Bankson, S. R. Sershen, B. Rivera, R. E. Price, J. D. Hazle, N. J. Halas and J. L. West, " <u>Nanoshell-mediated near-infrared thermal therapy of tumors under magnetic resonance guidance</u> ", <i>PNAS</i> , Vol. 100, No. 23, 13549-13554 (2003). |
| | 12. | ✓ | L. R. Hirsch, J. B. Jackson, A. Lee, N. J. Halas, and J. L. West, " <u>A Whole Blood Immunoassay Using Gold Nanoshells</u> ", <i>Anal. Chem.</i> , Vol. 75, 2377-2381 (2003). |
| | 13. | ✓ | L. R. Hirsch, R. J. Stafford, J. A. Bankson, S. R. Sershen, R. E. Price, J. D. Hazle, N. J. Halas, J. L. West, " <u>Targeted photothermal tumor therapy using metal nanoshells</u> ", <i>Proceedings of the Second Joint EMBS/BMES Conference</i> , Vol. 1, 530-531 (2002). |
| | 14. | ✓ | L. R. Hirsch, N. J. Halas, J. L. West, " <u>A rapid, near infrared, whole blood immunoassay using metal nanoshells</u> ", <i>Proceedings of the Second Joint EMBS/BMES Conference</i> , Vol. 1, 1646-1647 (2002). |
| TS | 15. | ✓ | J.B. Jackson and N.J. Halas, " <u>Surface-enhanced Raman scattering on tunable plasmonic nanoparticle substrates</u> ", <i>Proc. Natl. Acad. Sci. USA</i> , Vol. 101, No. 52, 17930-17935 (2004). |

Teresa Stueckle

1/27/06

Form PTO-1449

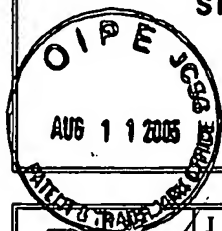
U.S. Department of Commerce
Patent and Trademark Office

Atty. Docket No.

Serial No.

01-661-A

10/034,451

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

Applicant: Mirkin, et al.

Filing Date:
December 28, 2001

Group: 1637

| | | |
|--------|---|--|
| 16. | ✓ | J. B. Jackson, S. L. Westcott, L. R. Hirsch, J. L. West, and N. J. Halas, " <u>Controlling the surface enhanced Raman effect via the nanoshell geometry</u> ", <i>Appl. Phys. Lett.</i> , Vol. 82, No. 2, 257-259 (2003). |
| 17. | ✓ | J. B. Jackson and N. J. Halas, " <u>Probing the optical near field of a nanolens</u> ", <i>Properties of Metal Nanostructures, Proceedings of SPIE</i> , Vol. 4810, 82-90 (2002). |
| 18. | ✓ | J. B. Jackson and N. J. Halas, " <u>Silver Nanoshells: Variations in Morphologies and Optical Properties</u> ", <i>J. Phys. Chem. B</i> , Vol. 105, 2743-2746 (2001). |
| 19. | ✓ | K. F. Kelly, E. T. Mickelson, R. H. Hauge, J. L. Margrave, and N. J. Halas, " <u>Nanoscale imaging of chemical interactions: fluorine on graphite</u> ", <i>Proc. Natl. Acad. Sci. U. S. A.</i> , Vol. 97, No. 19, 10318-10321 (2000). |
| 20. | ✓ | K. F. Kelly, I. W. Chiang, E. T. Mickelson, R. H. Hauge, J. L. Margrave, X. Wang, G. E. Scuseria, C. Radloff, N. J. Halas, " <u>Insight into the mechanism of sidewall functionalization of single-walled nanotubes: an STM study</u> ", <i>Chem. Phys. Lett.</i> , Vol. 313, 445-450 (1999). |
| 21. | ✓ | S. Lal, R. N. Taylor, J. B. Jackson, S. L. Westcott, P. Nordlander, and N. J. Halas, " <u>Light Interaction between Gold Nanoshells Plasmon Resonance and Planar Optical Waveguides</u> ", <i>J. Phys. Chem. B</i> , Vol. 106, 5609-5612 (2002). |
| 22. | ✓ | Yu Liu, Valery N. Khabashesku, and Naomi J. Halas, " <u>Fluorinated Nanodiamond as a Wet Chemistry Precursor for Diamond Coatings Covalently Bonded to Glass Surface</u> ", <i>J. Am. Chem. Soc.</i> , Vol. 127, 3712-3713 (2005). |
| 23. | ✓ | Christopher Loo, Amanda Lowery, Naomi Halas, Jennifer West, and Rebekah Drezek, " <u>Immunotargeted Nanoshells for Integrated Cancer Imaging and Therapy</u> ", <i>Nano Letters</i> , Vol. 5, No. 4, 709-711 (2005). |
| 24. | ✓ | Christopher Loo, B.S., Alex Lin, B.S., Leon Hirsch, B.S., Min-Ho Lee, M.S., Jennifer Barton, Ph.D., Naomi Halas, Ph.D., Jennifer West, Ph.D., Rebekah Drezek, Ph.D., " <u>Nanoshell-Enabled Photonics-Based Imaging and Therapy of Cancer</u> ", <i>Technology in Cancer Research and Treatment</i> , Vol. 3, 33-40 (Feb. 2004). |
| 25. | ✓ | C. E. Moran, C. Radloff, and N. J. Halas, " <u>Benchmark Fabrication of Submicrometer Metal Line and Island Arrays Using Passivative Microcontact Printing and Electroless Plating</u> ", <i>Adv. Mater.</i> , Vol. 15, No. 10, 804-807 (2003). |
| 26. | ✓ | C. E. Moran, J. M. Steele, A. Lee, C. Aguirre, C. Radloff, A. Rimberg, and N. J. Halas, " <u>Soft lithographic directed growth of wire grating arrays with optical resonances</u> ", <i>Properties of Metal Nanostructures, Proceedings of SPIE</i> , Vol. 4810, 1-6 (2002). |
| 27. | ✓ | C. E. Moran, G. D. Hale and N. J. Halas, " <u>Synthesis and Characterization of Lanthanide-Doped Silica Microspheres</u> ", <i>Langmuir</i> , Vol. 17, 8376-8379 (2001). |
| 28. | ✓ | Colleen L. Nehl, Nathaniel K. Grady, Glenn P. Goodrich, Felicia Tam, Naomi J. Halas, and Jason H. Hafner, " <u>Scattering Spectra of Single Gold Nanoshells</u> ", <i>Nano Letters</i> , Vol. 4, 2355-2359 (2004). |
| 29. | ✓ | S. J. Oldenburg, J. B. Jackson, S. L. Westcott, and N. J. Halas, " <u>Infrared Extinction Properties of Gold Nanoshells</u> ", <i>Appl. Phys. Lett.</i> , Vol. 75, No. 19, 2897-2899 (1999). |
| 30. | ✓ | S. J. Oldenburg, G. D. Hale, J. B. Jackson, and N. J. Halas, " <u>Light scattering from dipole and quadrupole nanoshell antennas</u> ", <i>Appl. Phys. Lett.</i> , Vol. 75, No. 8, 1063-1065 (1999). |
| 31. | ✓ | S. J. Oldenburg, S. L. Westcott, R. D. Averitt, and N. J. Halas, " <u>Surface Enhanced Raman Scattering in the Near Infrared using Metal Nanoshell Substrates</u> ", <i>J. Chem. Phys.</i> , Vol. 111, No. 10, 4729-4735 (1999). |
| 32. | ✓ | S. Oldenburg, R. D. Averitt, S. Westcott, and N. J. Halas, " <u>Nanoengineering of Optical Resonances</u> ", <i>Chem. Phys. Lett.</i> , Vol. 288, 243-247 (1998). |
| 33. | ✓ | D. Patrick O'Neal, Leon R. Hirsch, Naomi J. Halas, J. Donald Payne, Jennifer L. West, " <u>Photo-thermal tumor ablation in mice using near infrared-absorbing nanoparticles</u> ", <i>Cancer Letters</i> , Vol. 209, 171-176 (2004). |
| 34. | ✓ | T. Pham, J. B. Jackson, N. J. Halas, and T. R. Lee " <u>Preparation and Characterization of Gold Nanoshells Coated with Self-Assembled Monolayers</u> ", <i>Langmuir</i> , Vol. 18, 4915-4920 (2002). |
| 35. | ✓ | L. A. Porter, D. Ji, S. L. Westcott, M. Graupe, R. S. Czernuszewicz, N. J. Halas, and T. R. Lee, " <u>Gold and Silver Nanoparticles Functionalized by the Adsorption of Dialkyl Disulfides</u> ", <i>Langmuir</i> , Vol. 14, 7378-7386 (1998). |
| 36. | ✓ | E. Prodan, C. Radloff, N. J. Halas, P. Nordlander, " <u>A Hybridization Model for the Plasmon Response of Complex Nanostructures</u> ", <i>Science</i> , Vol. 302, 419-422 (2003). |
| TS 37. | ✓ | E. Prodan, P. Nordlander, N. J. Halas, " <u>Electronic Structure and Optical Properties of Gold Nanoshells</u> ", <i>Nano Letters</i> , Vol. 3, No. 10, 1411-1415 (2003). |

Teresa Stuebele

1/27/06


| | | | |
|--|--|-----------------------------------|--------------------------|
| Form PTO-1449 | U.S. Department of Commerce Patent and Trademark Office | Atty. Docket No. 01-661-A | Serial No. 10/034,451 |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | Applicant: Mirkin, et al. | |
| | | Filing Date: December 28, 2001 | Group: 1637 |



| | |
|----------|--|
| 38. ✓ | Prodan, P. Nordlander, and N. J. Halas, "Effects of dielectric screening on the optical properties of metallic nanoshells," <i>Chemical Physics Letters</i> , Vol. 368, 94-101 (2003). |
| 39. ✓ | C. Radloff and N. J. Halas, "The decomposition of gold nanoshells in carbon tetrachloride", <i>Properties of Metal Nanostructures, Proceedings of SPIE</i> , Vol. 4810, 21-27 (2002). |
| 40. ✓ | C. Radloff and N. J. Halas, "Enhanced Thermal Stability of Silica-encapsulated Metal Nanoshells", <i>Appl. Phys. Lett.</i> , Vol. 79, No. 5, 674-676 (2001). |
| 41. ✓ | S. R. Sershen, S. L. Westcott, N. J. Halas, and J. L. West, "Temperature-Sensitive Polymer-Nanoshell Composites for Photothermally Modulated Drug Delivery", <i>J. Biomedical Materials Research</i> , Vol. 51, 293-298 (2000). |
| 42. ✓ | S. R. Sershen, S. L. Westcott, N. J. Halas, J. L. West, "Independent optically addressable nanoparticle-polymer optomechanical composites", <i>Appl. Phys. Lett.</i> , Vol. 80, No. 24, 4609-4611 (2002). |
| 43. ✓ | S. R. Sershen, N. J. Halas, J. L. West, "Pulsatile release of insulin via photothermally modulated drug delivery", <i>Proceedings of the Second Joint EMBS/BMES Conference</i> , Vol. 1, 490-491 (2002). |
| 44. ✓ | S. R. Sershen, S. L. Westcott, J. L. West, and N. J. Halas, "An Opto-Mechanical Nanoshell-Polymer Composite", <i>Appl. Phys. B</i> , Vol. 73, 379-381 (2001). |
| 45. ✓ | D. D. Smith, L. Sibille, R. J. Cronise, A. J. Hunt, S. J. Oldenburg, D. Wolfe, and N. J. Halas, "Effect of Microgravity on the Growth of Silica Nanostructures", <i>Langmuir</i> , Vol. 16, 10055-10060 (2000). |
| 46. ✓ | Felicia Tam, Cristin Moran, and Naomi Halas, "Geometrical Parameters Controlling Sensitivity of Nanoshell Plasmon Resonances to Changes in Dielectric Environment", <i>J. Phys. Chem. B</i> , Vol. 108, 17290-17294 (2004). |
| 47. ✓ | F. Tam and N. J. Halas, "Plasmon Response of Nanoshell Dopants in Organic Films: A Simulation Study", <i>Progress in Organic Coatings</i> , Vol. 47, 275-278 (2003). |
| 48. ✓ | West, Jennifer L., Halas, Naomi J., "ENGINEERED NANOMATERIALS FOR BIOPHOTONICS APPLICATIONS: Improving Sensing, Imaging, and Therapeutics", <i>Annual Review of Biomedical Engineering</i> , Vol. 5, 285-292 (2003). |
| 49. ✓ | J. L. West and N. J. Halas, "Applications of Nanotechnology to Biotechnology - Commentary", <i>Current Opinion in Biotechnology</i> , Vol. 11, 215-217 (2000). |
| 50. ✓ | S. L. Westcott, J. B. Jackson, C. Radloff, and N. J. Halas, "Relative Contributions to the Plasmon Line Shape of Metal Nanoshells", <i>Phys. Rev. B</i> , Vol. 66, 155431-1 - 155431-5 (2002). |
| 51. ✓ | S. L. Westcott and N. J. Halas, "Electron Relaxation Dynamics in Semicontinuous Metal Films on Nanoparticle Surfaces", <i>Chem. Phys. Lett.</i> , Vol. 356, 207-213 (2002). |
| 52. ✓ | S. L. Westcott, R. D. Averitt, J. A. Wolfgang, P. Nordlander, and N. J. Halas, "Adsorbate-Induced Quenching of Hot Electrons in Gold Core-Shell Nanoparticles", <i>J. Phys. Chem. B</i> , Vol. 105, No. 41, 9913-9917 (2001). |
| 53. ✓ | S. L. Westcott, S. J. Oldenburg, T. R. Lee and N. J. Halas, "Construction of Simple Gold Nanoparticle Aggregates with Controlled Plasmon-Plasmon Interactions", <i>Chem. Phys. Lett.</i> , Vol. 300, 651-655 (1999). |
| 54. ✓ | S. Westcott, S. Oldenburg, T. R. Lee, and N. J. Halas, "Formation and Adsorption of Clusters of Gold Nanoparticles onto Functionalized Silica Nanoparticle Surfaces", <i>Langmuir</i> , Vol. 14, 5396-5401 (1998). |
| 55. ✓ | D. B. Wolfe, S. J. Oldenburg, S. L. Westcott, J. B. Jackson, M. S. Paley, and N. J. Halas, "Preparation and characterization of polymer-coated nanoparticles", <i>SPIE Proceedings</i> , Vol. 3793, 129-137 (1999). |
| TS 56. ✓ | C. Radloff, C.E. Moran, J.B. Jackson and N.J. Halas, "Nanoparticles: Building Blocks for Functional Nanostructures" in <i>Molecular Nanoelectronics</i> , Mark Reed and Takhee Lee, eds., American Scientific Publishers (2003). |

| | |
|-----------------------------|----------------------------|
| Examiner Teresa Stuebele | Date Considered 1/27/06 |
|-----------------------------|----------------------------|

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with any communication.

| | | | |
|---|---|-----------------------------------|----------------|
| FORM PTO-1449 (Rev. 2-32) | U.S. Department of Commerce Patent and Trademark Office | Atty. Docket No. | Serial No. |
| 01-661-A | | 10/034,451 | |
|  | INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) | Applicant: Mirkin et al. | |
| | | Filing Date: December 28, 2001 | Group: 1637 |

U.S. PATENT DOCUMENTS

| Examiner Initial | | Document Number | Date | Name | Class | Subclass | Filing Date if Appropriate |
|------------------|---|-----------------|------------|---------------|-------|----------|----------------------------|
| TS | 1 | 6,159,378 | 12/12/2000 | Holman et al. | 210 | 695 | duplicate |

FOREIGN PATENT DOCUMENTS

| Examiner Initial | | Document Number | Date | Country | Class | Subclass | Translation | |
|------------------|---|-----------------|------------|---------|-------|-----------|-------------|----|
| | | | | | | | Yes | No |
| | 2 | WO 95/22639 | 08/24/1995 | PCT | | duplicate | | |
| | 3 | WO 98/04740 | 02/05/1998 | PCT | | duplicate | | |
| | 4 | WO 01/06257 | 01/25/2001 | PCT | | duplicate | | |

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

| | |
|--------------------------|---|
| 5 | Cao et al., "DNA Modified Core-Shell Ag/Au Nanoparticles", J. Am. Chem. Soc., 2001, 123, 7961-7962. duplicate |
| 6 | Remita et al., "Radiolytic formation of bilayered Pt _{core} /Au _{shell} and Au _{core} /Pt _{shell} clusters in aqueous solution", Radiation Physics and Chemistry, 54 (1999) 463-473. duplicate |
| duplicate | Wang et al., "The surface chemistry of hybrid nanometer-sized particles I. Photochemical deposition of gold on ultrafine TiO ₂ particles", Colloids and Surfaces A: Physicochemical and Engineering Aspects, 131 (1998) 271-280. |
| EXAMINER Teresa Stuebele | |
| DATE CONSIDERED 1/24/06 | |

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.